

The method and computed tomography apparatus disclosed and claimed in the present application are for the purpose of reducing image artifacts that always are created in a spiral scan when the reconstructed image exhibits an image plane that is perpendicular to the system axis. Such image artifacts are prevented in the method and apparatus disclosed and claimed in the present application by the image plane of the reconstructed image being tilted relative to a first axis that intersects the system axis at a right angle, and also being tilted relative to a second axis that intersects both the first axis and the system axis at right angles.

The Tuy reference also is for the purpose of reducing image artifacts, but the image artifacts that are addressed in the Tuy reference are the result of scanning the subject with an x-ray beam having a fan that is smaller than the subject. For this purpose, the Tuy reference teaches, before the actual image reconstruction, weighting the data with a scan-dependent weighting factor. For the purpose of solving the problem addressed in the Tuy reference, the orientation that the image plane has relative to the system axis is irrelevant.

The Examiner has acknowledged as much by recognizing that the Tuy reference does not provide details regarding reconstructing images having an inclined image plane having an inclination angle γ relative to a first axis that intersects the system axis at a right angle, as well as being inclined by a tilt angle δ with respect to the system axis around a second axis that intersects the first axis and the system axis at right angles, as set forth in independent claims 1 and 18.

The Examiner relied on the Ning reference as providing such a teaching. Applicants respectfully submit that the Ning reference does not provide such a teaching, and further submit that even if such a teaching were present in the Ning

reference, a person of ordinary skill in the field of designing computed tomography systems would have no basis to modify the Tuy reference in accordance with such an alleged teaching.

The Ning reference is directed to reconstructing images in which the scan data for reconstruction are acquired during a rotation of the gantry in an orbit within a plane, and further data also are acquired by tilting the gantry along an arc that is perpendicular to the plane. Image artifacts are prevented in the case of a purely circular scan of the examination subject by the scan data that have been additionally acquired along the arc being taken into account in the conventional Feldkamp algorithm, expanded by a correction term. Therefore, as in the Tuy reference, in order to prevent the type of image artifacts addressed in the Ning reference, the orientation that the image plane used for reconstruction exhibits relative to the system axis is likewise irrelevant.

Therefore, the Ning reference does not provide any teaching to implement a reconstruction of images in a reconstruction image plane that exhibits a particular inclination relative to the system axis. In both the Tuy and Ning references, whether the plane of the reconstructed image exhibits any inclination whatsoever relative to the system axis is completely irrelevant.

The Examiner cited a number of passages in the Tuy and Ning references, however, upon reviewing each of those passages applicants are unable to find any teaching therein regarding the plane of the reconstructed image having any inclination relative to the system axis, or even mentioning such an inclination as being of any significance.

Therefore, even if the Tuy reference were modified in accordance with the teachings of the Ning reference, the teachings of the Ning reference do not go beyond those of the Tuy reference on this point, and therefore the subject matter of independent claims 1 and 18 still would not result from such a combination.

Applicants do not agree, however, with the Examiner's position that a person of ordinary skill in the field of designing computed tomography systems would have any reason to propose such a combination at all. The Examiner has stated that such a person of ordinary skill would make use of the teaching of the Ning reference to modify the Tuy reference in order to prevent image artifacts that result in the reconstruction of an image from data obtained in a spiral scan of a subject. Applicants do not agree with this conclusion of the Examiner, and submit that the Ning reference itself provides teachings that would dissuade such a person of ordinary skill from proposing such a combination. As explicitly stated in the Ning reference at column 3, lines 2-11, Ning considers a spiral scan to have a number of disadvantages associated therewith. The solution taught in the Ning reference is to depart from the use of a spiral scan, so as to increase the scan speed and increase the resolution of the resulting image. Reverting to a spiral scan in the Ning reference would simply reintroduce these disadvantages that are considered by Ning to be detrimental, and therefore would be a backwards step, according to Ning. Applicants submit these statements in the Ning reference would clearly dissuade a person of ordinary skill in the field of designing computed tomography systems, who has not had the benefit of first reading Applicants' disclosure, from making any sort of modification to the Tuy reference, which is explicitly for the purpose of conducting a

spiral scan, using the teachings of Ning, which are specifically intended as a departure from a spiral scan.

Moreover, even if a person of ordinary skill in the field of designing computed tomography systems were to propose such a combination (for reasons unknown to the present Applicants), in view of the opposing views of the benefits of a spiral scan in the two references, such a combination would be an insight supporting patentability rather than a reason for negating patentability.

Applicants therefore respectfully submit that claims 1 and 18 would not have been obvious to a person of ordinary skill in the field of designing computed tomography systems under the provisions of 35 U.S.C. §103(a), based on the teachings of Tuy and Ning.

As to claims 11-16 and 28-33, for the above reasons if even the Tuy/ Ning combination were further modified in view of the teachings of Larson et al., the subject matter of those dependent claims still would not result, since those dependent claims embody the subject matter of the independent claims therein. Even if the Examiner's statements regarding the teachings of Larson et al. are correct, modification of the Tuy/ Ning combination in view of the teachings of Larson et al. would not result in a method as set forth in any of dependent claims 11-16, nor an apparatus as set forth in any of dependent claims 28-33.

All claims of the application are therefore submitted to be in condition for allowance, and early reconsideration of the application is respectfully requested.

Submitted by,

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